OPERATOR MANUAL

Castle®

5540, 5545, 5550 WARMING CABINETS

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GETINGE Castle

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Related Publications:

Installation Instructions	350263
Service Manual	350265
Parts Catalog	350266

IMPORTANT

Special safety signs and instructions are used in this manual. Read them carefully before using the warming cabinet. It is the responsibility of the user to follow all recommendations.

DESCRIPTION OF SYMBOLS AND NOTES IN MANUAL

The following symbols with related notes appear in this manual.

""Danger" notes alert the user to the possibility of serious personal injury which could be fatal

"Warning" notes alert the user to the possibility of personal injury.

"Caution" notes alert the user to the possibility of damage to the equipment.

"Notes" alert the user to pertinent facts and conditions.

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The manufacturer's name has changed from MDT Corporation to Getinge/Castle, Inc. Although all publications are being revised to reflect this change, some oversights may occur during the transition. Any references to MDT Corporation or its divisions that may still appear in this publication now apply instead to Getinge/Castle, Inc. The full address and telephone number are on the front and back pages of this manual.

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TABLE OF CONTENTS

SECTION	PAGE
GENERAL	1
DESCRIPTION OF COMPONENTS	1
Door Switch	1
Reversible Door	1
Filter	1
Control Head Assembly Center Storage Compartment	1
Optional Recorder	1
Adjustable Shelves	1
Main Power Switch/Circuit Breaker	1
Touch Control Panel	2
OPERATING INSTRUCTIONS	2
Turning the Warming Cabinet On	2
Selecting the Set-Temperature	3
Loading the Cabinet	4
Unloading the Cabinet	4
Turning the Warming Cabinet Off	5
CONDITION INDICATORS	5
SHELF ADJUSTMENT	5
RECORDER CHART REPLACEMENT	5
PREVENTIVE MAINTENANCE	6
SPARE PARTS	7
QUALITY SERVICE - RELIABLE PERFORMANCE	7
INDEX	I-1

IMPORTANT

The special safety instructions that follow appear within the manual. Read them carefully before operating the warming cabinet, and follow the instructions.

"Danger" notes alert the user to the possibility of serious personal injury which could be fatal.

Operating Instructions **page 2**

Do not relocate the warming cabinet to, or operate the warming cabinet in, any area where flammable agents may be introduced into the atmosphere. This unit contains electrical components designed to heat and circulate air within the cabinet. Contact with an airborne flammable agent may cause explosion or fire resulting in serious personal injury, or damage to equipment and surroundings.

Loading The Cabinet **page 4**

Do not place items in the warming cabinet which could introduce flammable agents into the cabinet atmosphere. This unit contains electrical components designed to heat and circulate air within the cabinet. Contact with an airborne flammable agent may cause explosion or fire resulting in serious personal injury, or damage to equipment and surroundings.

"Warning" notes alert the user to the possibility of personal injury.

Selecting the Set-Temperature **page 3**
Unloading The Cabinet **page 4**

Items heated to temperatures over 49°C (120°F) can burn skin tissue. Do not heat any item that may come in contact with bare skin to temperatures exceeding 49°C (120°F). If you do heat items to temperatures in excess of 49°C, temperatures, be careful when removing those items from the warming cabinet. Removing hot items with an unprotected hand may result in burns to skin tissue. To avoid possible burns, wear protective gloves or use tongs when removing hot items from the warming cabinet.

Unloading The Cabinet **page 4**

When the warming cabinet is turned off, the internal temperature of the cabinet's contents will not decrease as rapidly as the internal cabinet temperature itself. Some glassware, if heated to high temperature, may react violently when brought into sudden contact with lower temperatures of an outside environment. To protect your eyes from possible shattering glass, wear approved safety glasses when removing glassware from the cabinet.

Loading The Cabinet **page 4**
Unloading The Cabinet **page 4**

When the warming cabinet is operating, contact with the interior surface of the door or any of the heated compartments could result in burns to the skin. Avoid contact with interior cabinet surfaces when replenishing or removing items in the warming cabinet.

Condition Indicators **page 5**

If a problem occurs, and relocation of heated items is necessary, allow sufficient time (a minimum of two hours) for the internal temperature of the items to drop to a level which would enable removal without causing possible damage to the items, or resulting in injury to personnel.

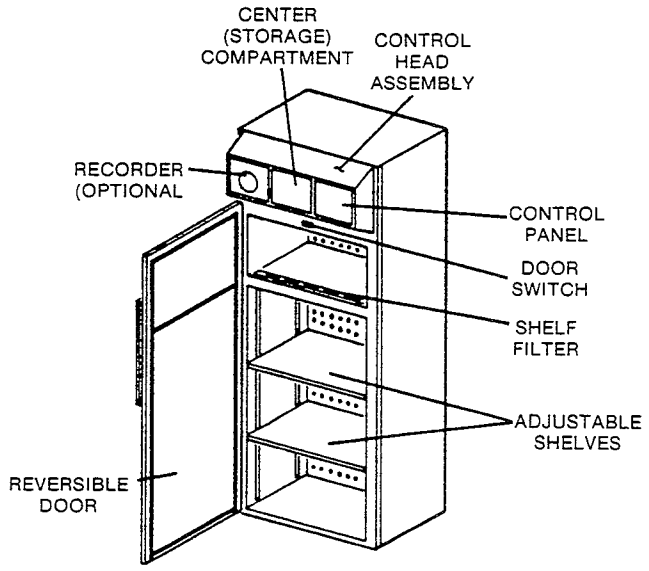
Shelf Adjustment **page 5**

To prevent burns to the skin when adjusting shelf height, either allow sufficient time (at least two hours) for the shelves to cool before handling them, or wear protective gloves when handling hot shelves.

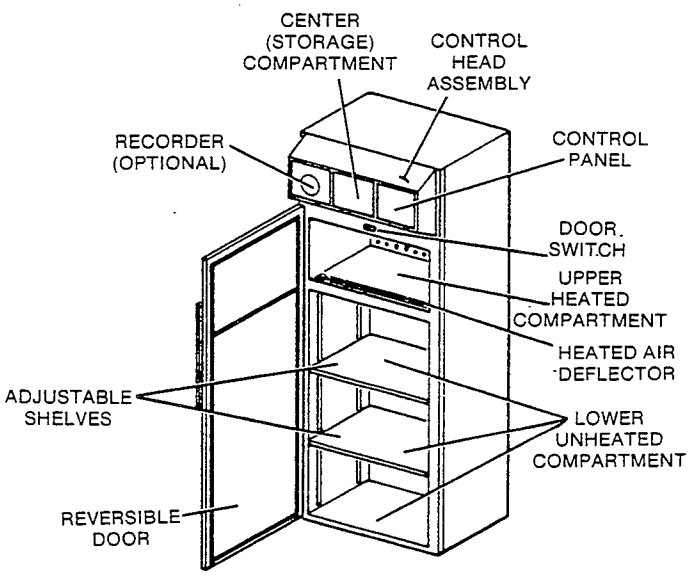
Preventive Maintenance **page 6**

The filter surroundings may be hot. Avoid possible burns to skin by allowing the cabinet to cool before removing the filter.

5540, 5545 & 5550 WARMING CABINET



MODEL 5550
(Cabinet Model)



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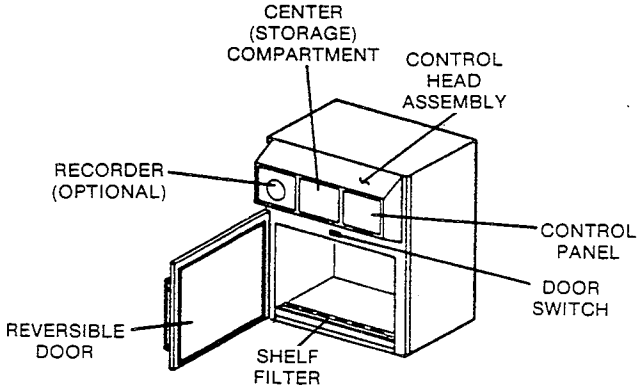
(Cabinet Model)



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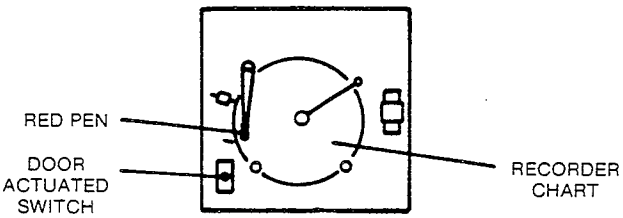
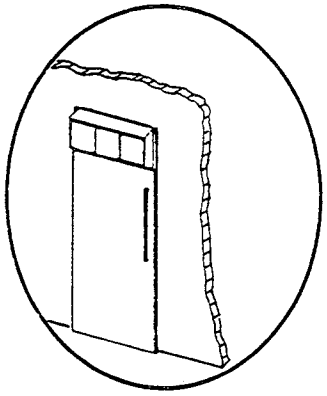
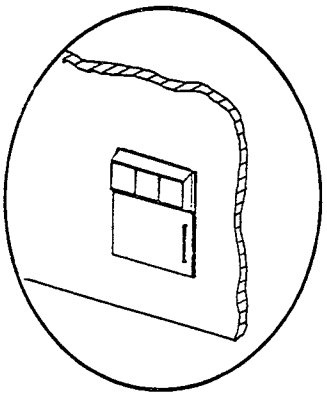
(Cabinet Model)



OPTIONAL RECORDER



MODEL 5545 & 5550
(Recessed Model)



MODEL 5540
(Recessed Model)

GENERAL

Castle 5540, 5545, and 5550 Warming Cabinets are designed for the heating and storage of solutions, blankets, towels, and other dry goods. Cabinet temperature is adjustable from 36°C (97°F) to 71°C (160°F).

The compact **5540** Warming Cabinet provides one compartment capable of holding 20 two-liter flasks. Its filter, located in the front of the compartment, filters the heated air and directs it upward.

The **5545** Warming Cabinet has an upper heated compartment and a lower unheated compartment with two adjustable shelves. Air from the upper compartment does not circulate into the lower compartment, so the lower compartment remains at ambient temperature regardless of the upper compartment's temperature.

The **5550** Warming Cabinet circulates heated air evenly over items placed on each of its four shelves. Each shelf is capable of holding 20 two-liter flasks. The two shelves provided are adjustable, thus allowing the height of the lower three compartments to be adjustable. The filter, provided in the top shelf, filters the heated air from the lower shelves and directs it upward.

DESCRIPTION OF COMPONENTS

Door Switch

Closing the warming cabinet door depresses the door switch and allows electrical power to contact the heating circuit. Opening the door, releases the door switch and shuts off electrical power to the heating circuit.

Reversible Door

The warming cabinet door swings open either to the left or right, depending upon the individual unit. If you prefer that the door swing open in the opposite direction, contact a fully authorized MDT Biologic Company Product Support Representative to perform the conversion.

Filter

Keeps airborne dust and debris from entering the heated compartment, and directs the heated air upward.

Control Head Assembly
Center Storage Compartment

May be used for ready access of recorder charts, ink pens cartridges, etc.

Optional Recorder

A warming cabinet may be equipped with an optional recorder to record the temperature of the cabinet over a 24 hour period.

Recorder Chart

The recorder chart is graduated in single degree increments from 0° to 100° centigrade (32° to 212° farenheit) over a 24 hour period.

Door Actuated Switch

Closing the recorder door triggers this switch to start the recorder; opening the recorder door triggers this switch to stop the recorder. If you wish to record the cabinet temperature while the recorder door is open, simply pull the door actuator switch outward.

When you open the recorder door, the pen arm automatically lifts off the chart and moves to the holding ramp where it will remain until you close the recorder door.

Adjustable Shelves
(Models 5545 and 5550 Only)

To increase or decrease the height of the three compartments, you may raise, lower, or remove the two adjustable shelves.

Main Power Switch/Circuit Breaker

Turning off the main power switch/circuit breaker, located under the control bezel, removes all electrical power from the unit.

Touch Control Panel

Power ON

Pressing this button turns on the warming cabinet, and activates the control panel.

LED Indicator

Pressing the **ON** button illuminates the green "ON" LED.

Power OFF

Pressing this button turns off the warming cabinet, de-activatates the control panel, and allows the cabinet to return to ambient temperature.

Set-Temp. Up and Down Arrow Buttons

Pressing these buttons allows you to increase or decrease the cabinet temperature in 1°C (1 or 2°F) increments. Set-temperatures range from 36°C (97°F) to 71°C (160°F).

Actual Temperature Display

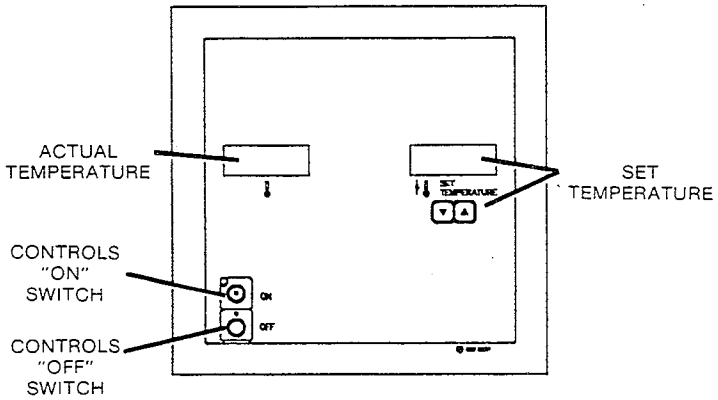
While the control panel is activated, the left-hand temperature display continuously indicates the actual temperature inside the warming cabinet.

Set-Point Temperature Display

While the control panel is activated the right-hand temperature display continuously indicates the temperature you selected for the warming cabinet to maintain.

Condition Indicator

"**OH**" appears in the temperature selected display if the temperature of the warming cabinet rises above the set temperature by more than 4°C (7°F), thus alerting you to an overheat condition.



OPERATING INSTRUCTIONS

DANGER

Do not relocate the warming cabinet to, or operate the warming cabinet in, any area where flammable agents may be introduced into the atmosphere. This unit contains electrical components designed to heat and circulate air within the cabinet. Contact with an airborne flammable agent may cause explosion or fire resulting in serious personal injury, or damage to equipment and surroundings.

NOTE

To prevent voiding the product warranty, do not operate the warming cabinet until an MDT Product Support Representative has performed the required mechanical adjustments and electrical tests.

NOTE

If the warming cabinet is equipped with an optional recorder, replace the 24 hour recorder chart on a daily basis. Refer to "Recorder Chart Replacement" on page 5.

Turning The Warming Cabinet On

1. Be sure that the main power circuit breaker located under the control bezel is turned on.
2. Turn the warming cabinet on by pressing the green **ON** button in the lower left corner of the control panel.
   - The left-hand temperature display will show the current temperature inside the cabinet.
   - The unit will begin heating the inside of the cabinet, providing that the door is closed. The unit will not begin heating if the door is open. If you open the door while the unit is operating, the heating system will shut off and remain off until you close the door.

Selecting The Set-Temperature

Items heated to temperatures over 49°C (120°F) can burn skin tissue. Do not heat any item that may come in contact with bare skin to temperatures exceeding 49°C (120°F).

Set the cabinet temperature by pressing the up and down SET-TEMPERATURE arrow buttons. Set-temperature ranges from 36°C (97°F) to 71°C (160°F).

- To change the cabinet temperature by single degree increments, press and release either arrow button.
- To rapidly advance through the temperature range, press and hold either arrow key until the desired temperature appears on the display.

The temperature displayed will advance slowly at first, but after three seconds, will advance quickly.

You may change the warming cabinet's set-temperature at any time — even while the unit is operating. However, if the unit is operating, do not lower the set-temperature to more than 4°C below the actual temperature, otherwise the warming cabinet will display an overheat condition.

If, while the unit is operating, you wish to lower the set-temperature to more than 4°C below the actual temperature, follow either of the procedures below.

Procedure 1 Decrease the set-temperature 4°C below the actual temperature. Wait for the temperature to drop to the new set-temperature. Repeat the process until the cabinet reaches the desired temperature.

Procedure 2 Open the cabinet door. Watch the actual temperature shown on the display. When the temperature displayed matches your new desired set-temperature, close the door, and using the set-temperature arrow buttons, select a new set-temperature.

Temperature Conversion Chart

°C = °F	°C = °F	°C = °F
36 97	48 118	60 140
37 99	49 120	61 142
38 100	50 122	62 144
39 102	51 124	63 145
40 104	52 126	64 147
41 106	53 127	65 147
42 108	54 130	66 151
43 109	55 131	67 153
44 111	56 133	68 154
45 113	57 135	69 156
46 115	58 136	70 158
47 117	59 138	71 160

Loading The Cabinet

Do not place items in the warming cabinet which could introduce flammable agents into the cabinet atmosphere. This unit contains electrical components designed to heat and circulate air within the cabinet. Contact with an airborne flammable agent may cause explosion or fire resulting in serious personal injury, or damage to the equipment and surroundings.

When the warming cabinet is operating, contact with the interior surface of the door or any of the heated compartments could result in burns to the skin. Avoid contact with interior cabinet surfaces when replenishing or removing items in the warming cabinet.

Do not store items in the heated section of the warming cabinet that may be packaged in material unable to withstand the selected temperature.

Below are some pointers to bear in mind when placing solution flasks and dry goods into the warming cabinet:

- Always place solutions on the upper-most shelves, regardless of whether they are the only items stored in the cabinet or whether they are stored with dry goods.
- Storing dry goods and solution flasks on the same shelf is acceptable.
- Do not place items whose combined weight exceeds 100 lbs. onto the adjustable shelves.
- Always maintain a 2-inch clearance between the items and the ceiling of the cabinet chamber to permit unobstructed circulation of heated air.
- Position items in the warming cabinet so that they do not obstruct the circulation of air.
- Ensure that items are stored in the warming cabinet long enough to heat through before removing them for use. Allow a minimum of **6 hours for dry goods** to reach the set-temperature, and a minimum of **8 hours for solutions** to reach set-temperature.

Unloading The Cabinet

When unloading solution flasks, and dry goods from the warming cabinet, bear in mind the following safety points:

When the warming cabinet is turned off, the internal temperature of heated glassware and dry goods will not decrease as rapidly as the internal cabinet temperature. Some glassware, if heated to high temperature, may react violently when brought into sudden contact with lower temperatures of an outside environment. To protect your eyes from possible shattering glass, wear approved safety glasses when removing glassware from the cabinet.

Items heated to temperatures over 49°C (120°F) can burn skin tissue. Do not heat any item that may come in contact with bare skin to temperatures exceeding 49°C (120°F). If you do heat items to temperatures in excess of 49°C, temperatures, be careful when removing those items from the warming cabinet. Removing hot items with an unprotected hand may result in burns to skin tissue. To avoid possible burns, wear protective gloves or use tongs when removing hot items from the warming cabinet.

When the warming cabinet is operating, contact with the interior surface of the door or any of the heated compartments could result in burns to the skin. Avoid contact with interior cabinet surfaces when removing or replenishing items in the warming cabinet.

Turning The Warming Cabinet Off

Turn the cabinet off by pressing the red **OFF** button in the lower left corner of the control panel.

CONDITION INDICATORS

An overheat condition occurs if the interior temperature of the cabinet rises to 4°C (7°F) over the selected temperature. If the warming cabinet experiences an overheat condition, the unit will automatically shut down the electrical power to the heating circuit, display the letters **OH** in the temperature display, and sound an alarm alerting you of the condition. If this condition ever arises, press the **OFF** button and call for qualified Product Support Personnel.

If a problem occurs and relocation of heated items is necessary, allow sufficient time (a minimum of two hours) for the internal temperature of the items to drop to a level which would enable removal without causing possible damage to the items, or resulting in injury to personnel.

1. Wait at least two hours before opening the door to ensure that the unit has had sufficient time to cool.
2. Use extreme care when removing glassware and solutions; items in the cabinet at the time of the overheat condition may be extremely hot!
3. It is possible for a secondary overheat condition to occur in which the main AC circuit breaker will be shut off automatically. Under these conditions the display panel will be turned off and cannot be turned back on by pressing the green "ON" button. If this condition arises, contact a fully authorized MDT Product Support Representative to address the problem and reset the unit.

SHELF ADJUSTMENT

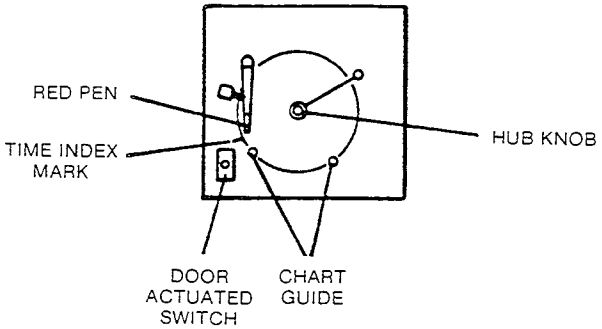
You may change the height of the three lower compartments by adjusting the height of either of the two shelves.

To prevent burns to the skin when adjusting shelf height, either allow sufficient time (at least two hours) for the shelves to cool before handling them, or wear protective gloves when handling hot shelves.

1. Lift the shelf off the four bracket clips attached to the four shelf pilasters; remove the shelf from the cabinet chamber.
2. Remove the clips from the shelf pilasters by squeezing the flanges of the bracket clips while tilting the clips upward.
3. Reassemble the bracket clips to new positions on the shelf pilasters and place the shelf back on the clips. Ensure that the rolled edge of the shelf is toward the front of the cabinet.

RECORDER CHART REPLACEMENT

1. Open the recorder door. The pen arm will automatically lift off the chart and move to its holding ramp.
2. Unscrew the hub knob.
3. Remove the used chart.
4. Place the new chart over the hub and slip the chart edges under the two guides.
5. Align the correct daily time line on the chart with the time index mark on the recorder.
6. Replace the hub knob and tighten it securely.
7. Shut the recorder door. The pen arm will automatically move from its holding ramp back to the chart.



PREVENTIVE MAINTENANCE

WEEKLY

Door Gasket

Clean the door gasket with a mild cleaning agent. Inspect the door gasket for damage that might prevent a good sealing surface.

WHEN REQUIRED

Control Head Assembly

Wipe the control head assembly with a soft, dry cloth.

External And Internal Surfaces

Wash all exterior and interior surfaces of the warming cabinet (**except** for the control head assembly) with a mild cleaning agent.

Filter

Replace the filter as needed. Follow the instructions for removing the filter.

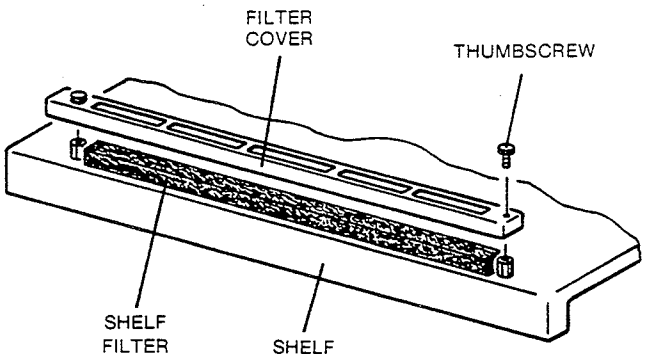
The filter surroundings may be hot. Avoid possible burns to skin by allowing the cabinet to cool a minimum of two hours before removing the filter.

To prevent the circulation of unfiltered air through the unit, MDT recommends that you do not operate the warming cabinet without the filter in place.

1. Rotate the thumbscrews holding the filter in place.
2. Remove the filter cover.

A clogged filter restricts proper circulation of air inside the warming cabinet.

3. Inspect the filter. If the filter is clogged, replace it with a new filter.
4. Replace the filter and secure the cover in place with the thumbscrews.
5. Resume normal operation.



REPLACING FILTER

SPARE PARTS

To ensure that parts are immediately available when needed, maintain a stock of the parts listed below. Parts with a prefix "+" are required for routine maintenance.

	Part No.	Part Description	Recommended Quantity
	69089	Relay, solid state (2-1/2 amp)	1
	518404	Relay, solid state (45 amp)	1
	69094	Fan, 120V, 50/60 Hz, 127 CFM	2
or	69095	Fan, 230V, 50/60 Hz, 127 CFM	2
	69058	Door Gasket, Model 5540	1
	69037	Door Gasket, Models 5545 & 5550	1
	69216	Shelf Gasket, Models 5545 & 5550	1
	69195	Filter, clean air	1
	518407	Temperature probe assembly	1
	69107	Thermostat, auto reset, NO	1
	530482	Temp. Recording Charts, 24 hr (°C/°F)	1 box of 100

QUALITY SERVICE — RELIABLE PERFORMANCE

MDT recommends preventive maintenance performed by factory trained Product Support Representatives, using authorized parts and service techniques. Recognizing symptoms of potential trouble and making corrections immediately is less costly and less time consuming than repairing damaged equipment. Our performance assurance plan offers scientific maintenance, not merely repair service.

For quality service on this equipment and information on our performance assurance plan, contact your nearest MDT Biologic Company District Service Office; write to MDT Biologic Company, 1777 East Henrietta Road, Rochester, New York 14692; or telephone area code 716/475-1400.

To ensure that parts are immediately available when needed, maintain a stock of the spare parts.

A Service Manual and a Parts Catalog for this unit may be purchased from MDT Biologic Company.

NOTES

A

ACTUAL TEMPERATURE DISPLAY 2
ADJUSTABLE SHELVES 1

B

BREAKER 1

C

CHART, RECORDER 1
CIRCUIT BREAKER 1
COMPONENTS 1
CONDITION INDICATORS 5
CONTROL HEAD ASSEMBLY 1, 6
CONTROL PANEL 2
Power OFF 2, 5
Power ON 2
Set Drying Temperature 2
Set Temperature 2

D

DANGERS iv
DESCRIPTION 1
DISPLAY
Actual Temperature 2
Set-Point Temperature 2
DOOR ACTUATED SWITCH 1
DOOR GASKET 6
DOOR SWITCH 1
DOOR, REVERSIBLE 1

E

EXTERNAL SURFACES 6

F

FILTER 1, 6

G

GENERAL 1

I

INTERNAL SURRFACES 6

L

LED INDICATORS 2
LOADING WARMING CABINET 4

M

MAINTENANCE 6
Control Head Assembly 6
Door Gasket 6
External and Internal Surfaces 6
Filter 6

M Cont'd

MODEL 5540 1
MODEL 5545 1
MODEL 5550 1

O

OFF 2, 5
ON 2
OPERATING INSTRUCTIONS 2

P

PERFORMANCE ASSURANCE 7
POWER OFF 2, 5
POWER ON 2
POWER SWITCH 1
PREVENTIVE MAINTENANCE 6

R

RECORDER, OPTIONAL 1
Chart 1
Door 5
Door Switch 1
Replacement 5
REPLACEMENT, RECORDER CHART 5
REVERSIBLE DOOR 1

S

SELECT TEMPERATURE 2, 3
SERVICE 7
SET-POINT TEMPERATURE DISPLAY 2
SHELF ADJUSTMENT 5
SHELVES 1
SHUT DOWN 5
SPARE PARTS 7
STORAGE COMPARTMENT 1
SWITCH
    Door 1
    Main Power 1

T

TEMPERATURE 2, 3
TOUCH CONTROL PANEL 2
TURNING WARMING CABINET OFF 5
TURNING WARMING CABINET ON 2

U

UNLOADING WARMING CABINET 4

W

WEEKLY MAINTENANCE 6

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